

Remarks:

Examiner's Position

The Examiner has maintained the rejection of July 22, 2010.

Disposition of the Claims

The Examiner has rejected Claim 24 under 35 U.S.C. 102(e) as being anticipated by Carrick, U.S. PG Pub. No. 2003/0134756.

The Examiner has rejected Claims 1-22 and 24-26, under 35 U.S.C. 103(a) as being unpatentable over Hutchings (U.S. Patent No. 3,076,841) in view of Harrison (WO 01/70830) and Nicolet (U.S. Patent No. 4,321,214).

The Examiner has rejected Claims 23 and 27 under 35 U.S.C. 103(a) as being unpatentable over Hutchings in view of Harrison and Nicolet as applied to Claims 1-22 above, and further in view of Gragson (U.S. Patent No. 3,384,585).

The Examiner has rejected Claim 25 under 35 U.S.C. 103(a) as being unpatentable over Carrick in view of Hutchings.

The Examiner has rejected Claim 26 under 35 U.S.C. 103(a) as being unpatentable over Carrick in view of Harrison.

The Examiner has rejected Claim 27 under 35 U.S.C. 103(a) as being unpatentable over Carrick in view of Gragson.

Summary of the Invention

Before considering the art rejection, Applicants will briefly review the present invention.

Applicants have discovered an improved process for making polyalkenyl sulfonic acids and the corresponding overbased sulfonates. In particular, the Applicants' invention employs a polyalkenyl sulfonic acid treatment step. This step treats the reaction product and by-products of polyalkene and sulfur trioxide (i.e., polyalkenyl sulfonic acid, sulfuric acid, recovered polyalkene sulfones, and sulfur trioxide) prior to the polyalkenyl sulfonic acid being overbased in a subsequent reaction. The treatment step stabilizes the polyalkenyl sulfonic acid product and by-products by neutralizing the acid with a neutralizing agent, such as an alkaline earth metal hydroxide. This treatment step takes place within a narrow range of time (i.e., between 2 seconds and one hour) and before further processing the polyalkenyl sulfonic acid.

After the polyalkenyl sulfonic acid product has been neutralized, it is either stored for further processing (i.e., overbasing) or immediately further processed (i.e., overbasing). In a separate step, the "neutralized" polyalkenyl sulfonic acid is overbased with an alkaline earth metal compound.

One notable aspect about the present invention is the treatment step. In essence, the treatment step may be seen as an overbasing pre-treatment step that prepares the sulfonic acid for overbasing. The inventors have discovered that the quantity of sulfonic acid, which is the product of the polyalkylene SO_3 reaction, increases when this pre-treatment step is employed. As a result of this pre-treatment step, there is an increased yield of PIB sulfonic acid which thereby

results in an increased yield of sulfonate, which is the product of the overbasing step.

This invention solves the problem of lower molecular weight PIB sulfonic acids and sultones that form from the sulfonic acid reaction. The inventors have discovered a process for increasing the yield of PIB sulfonic acids and a process for decreasing sultone formation.

Arguments

Applicants maintain their previous arguments and submit Gallacher et al., U.S. Patent No. 5,023,016 ('016 Patent), in an Information Disclosure Statement. This reference is submitted to support the Applicants' position that a polyalkenyl sulfonic acid and a petroleum sulfonic acid are not interchangeable because each has different properties. Gallacher states that alkaryl sulfonic acids have limited thermal stability (see column 2, lines 27-30). Accordingly, one of ordinary skill in the art would not have been motivated to combine the cited references of Hutchings, Gragson and Harrison, which contain one of a polyalkenyl sulfonic acid, an alkaryl sulfonic acid or petroleum sulfonic acid knowing that polyalkenyl and alkaryl sulfonic acids have different properties..

The Examiner maintains the position that there is motivation to combine the references because Harrison states that "there is a need for low cost synthetic sulfonates that have good performance properties and can serve as a replacement for the natural sulfonates." (see Harrison at p. 1, lines 20-22).

Applicants submit that the wholesale replacement of a natural sulfonate with a synthetic sulfonate is not the same as interchanging a reactant, such as a petroleum sulfonic acid with a polyalkenyl sulfonic acid.

Although the Harrison reference suggests that its polyalkenyl sulfonates could be used as substitute where natural sulfonates are employed (e.g., as a lubricating oil additive), there is nothing in Harrison that suggests replacing the polyalkenyl reactant with petroleum sulfonic acid. The statement in Harrison is directed to replacing a sulfonate. Again, Applicants submit that the Examiner has failed to provide a motivation for combining Harrison with Gragson and Nicolet.

The presently claimed invention is directed to **a process** of making a stabilized polyalkenyl sulfonic acid. There is nothing in the presently claimed invention that claims **a product** (i.e., a petroleum sulfonate or a polyalkenyl sulfonate). The Examiner has asserted that a synthetic sulfonate could replace a natural sulfonate. Applicants submit that the Examiner's assertion is misplaced, especially since the claims are directed to a process and the sulfonate is a product.

Conclusion

It is respectfully submitted that all of the rejections set forth by the Examiner, and the assertions made in support thereof, have been made as if Applicants' invention were included as part of the knowledge possessed by one skilled in the art. It is clearly impermissible, however, for the Examiner to use the hindsight of the present application in making these rejections, which it appears the Examiner has done. It is respectfully submitted that Applicants have shown that one skilled in the art at the time of the present invention, absent the teachings of the present application disclosure, would not choose only to view and consider the portions of the reference which the Examiner erroneously contends he would, thereby disregarding the other portions which are also set forth therein and which

Applicants submit are equally as important to understanding the reference as a whole.

For the reasons stated, Applicants submit that this application is in condition for allowance and notice to that effect is earnestly solicited.

The Director of Patents is hereby authorized to charge any fees which maybe required, or credit any overpayment, to Deposit Account Number 03-1620 for the above-referenced patent application.

Respectfully submitted,

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